Scalable, high-performance storage for on demand computing environments

IBM System Storage DS4800

Highlights

- ***4 Gbps Fibre Channel interface technology***
- ***Up to 1600 MBps bandwidth for high throughput applications***
- ***Fibre Channel and SATA hard disk drives supported***
- ***Includes IBM TotalStorage® DS4000™ Storage Manager to help centrally manage the DS4000 series***
- ***Eight host channels for increased connectivity***

4GB Fibre Channel interface technology

The IBM System Storage™ DS4800 disk storage system supports a high-performance 4 Gbps Fibre Channel interface for increased host connectivity to deliver necessary bandwidth for high-throughput applications. It is designed for data-intensive applications that demand increased connectivity provided by eight 4 Gbps host channels designed to provide up to 1600 MBps of sustained bandwidth for high-throughput applications through the eight channels directly attached to the host servers or connected to a Fibre Channel storage area network (SAN).

Designed to help lower your Total Cost of Ownership (TCO)

The IBM System Storage DS4800 Disk Storage System offers customers a 4 Gbps SAN solution to take advantage of the performance offered by 4 Gbps technology. There are two ways to

measure performance of a SAN device: megabytes per second (MBps) and input/output per second (IOPS). The IBM DS4800 4 Gbps SAN product has very impressive performance numbers. It is designed to offer up to 1600 MBps throughput with up to 550,000 IOPS. A 2 Gbps storage array can require up to twice as many host ports as a 4 Gbps array to deliver the throughput of four 4 Gbps ports. This frees up ports in the SAN for each array.

On the host side, if a server requires more than two 2 Gbps host bus adapters (HBAs) to attain the required performance (a server should have at least two HBAs for availability), then that number can be halved with 4 Gbps. Fewer HBAs help lower the number of switch ports used and can help reduce overall cost.

Business continuity

IBM System Storage DS4800 Disk Storage System offers the latest innovation from IBM in storage infrastructure performance and management, helping to enable you to develop storage environments that can deliver unprecedented data availability. High availability and reliability with a choice of multiple RAID levels and redundant, hot-swappable components—the DS4800 Disk Storage System can help you maintain data availability and security, enabling enterprise-inspired levels of reliability, availability, security and serviceability.

Resiliency features—The DS4800 Disk Storage System is designed to deliver powerful, dynamic capabilities that help protect data and prevent failure, not just respond and recover. Disaster recovery—point-in-time copying with IBM FlashCopy®, copy a volume with VolumeCopy and remote mirroring with Enhanced Remote Mirroring can provide enterprise-class disaster recovery strategies.

One of the key advantages of the DS4800 4 Gbps technologies is that it is backward compatible with 2 Gbps and even 1 Gbps. That means you need not replace your entire SAN with 4 Gbps technology, but you can add the new technology incrementally. Of course, 4 Gbps products will slow down to the 2 Gbps or 1 Gbps speed if they are connected, but zoning can allow a rolling upgrade strategy with minimal disruption.

Information lifecycle management (ILM)

Information is the lifeblood of an on demand business. With the IBM DS4800 offering 4 Gbps technology, the IBM DS4000 series can allow flexible access and a broader range of scale and performance options, providing structure and context to your enterprise information. As a result, you have the freedom to build data management strategies that align with your evolving information demands.

Information is the lifeblood of on demand business, and how that information is managed can become a key strategy of the IT organization. The IBM DS4800 is designed to accommodate the changing value of data over time while maintaining data availability.

IBM TotalStorage and IBM System Storage DS4000

The IBM TotalStorage and IBM System Storage DS4000 series are well known for exceptional performance, robust functionality and unparalleled ease of use. Building on this successful heritage, the new DS4800 combines next-generation 4 Gbps Fibre Channel (FC) technology. The DS4000 series proven storage technology can create a system designed to handle

some of the most compute-intensive workloads and provide robust functionality while maintaining availability.

The DS4800 controller is designed to deliver up to three times the throughput performance of the DS4500. Excelling at IOPS and MBps, the DS4800 is a great fit for both transaction-oriented and bandwidth-intensive applications and is designed to easily satisfy some of the most performance-hungry workloads. Additionally, the DS4800 is a great choice for environments with intense replication requirements, because its extra "horsepower" is designed to efficiently handle the additional performance demands of FlashCopy, VolumeCopy and Enhanced Remote Mirroring.

The DS4800 has eight independent 4 Gbps FC host ports for direct-attachment to host (FC-AL) or fabric attachment to storage area networks (FC-SW). As one of the industry's first enterprise-class storage systems based on 4 Gbps FC technologies, the DS4800 is designed to enable customers to prepare for the future while fully utilizing their present infrastructure. It is designed with the ability to auto-negotiate FC connection speeds, allowing it to integrate into an existing 1 Gbps or 2 Gbps infrastructure, helping enable these environments to immediately benefit from its performance and connectivity improvements while helping protect investment when the SAN inevitably becomes 4 Gbps.

The DS4800 storage system's eight 4 Gbps drive connections support up to 224 disk drives with the attachment of 14 DS4000 EXP810, 16 DS4000 EXP710 or 16 DS4000 EXP100 disk enclosures, making it a great choice for performance-oriented or capacity-oriented storage requirements. Models 80, 82, 84, and 88 all support over 67.2TB of Fibre Channel (FC) physical storage capacity and 112TB of Serial ATA (SATA) physical storage capacity with attachment of 14 EXP810 storage expansion units. Additionally, support for high-performance Fibre Channel and high-capacity serial ATA (SATA) disk drives enables a single DS4800 storage system to satisfy intermix of primary and secondary storage.

The DS4800 expands the DS4000 history of flexibility with another configuration option—cache size. The DS4800 is available in four models: Model 80 that will have 4GB of physical cache memory (2GB per controller), Model 82 that will have 4GB of physical cache memory (2GB per controller), Model 84 with 8GB of physical cache memory (4GB per controller), and Model 88 supporting 16GB of physical cache memory (8GB per controller).

The DS4800 fits seamlessly into the DS4000 series. It runs the same robust, yet intuitive, storage management software—designed to allow maximum utilization of your storage capacity and complete control over your rapidly growing storage environment.

Wide range of storage consolidation and clustering applications

The IBM System Storage DS4800 is designed to be an affordable, scalable storage server for storage consolidation and clustering applications. Its modular architecture—which includes Dynamic Capacity Addition and Dynamic Volume Expansion—can support on demand environments by helping to enable storage to grow as demands increase. Autonomic features such as online firmware upgrades and DS4000 Service Alert also help enhance the system's usability.

The DS4800 is designed to help consolidate direct-attached storage into a centrally managed, shared or storage area network (SAN) environment. With built-in support for eight Fibre Channel-attached servers, the need for additional switches is reduced or eliminated, helping to make server clustering more cost-effective.

4 Gbps expansion unit supported on DS4800

The DS4000 EXP810 is a 4 Gbps switched disk expansion unit supporting 16 Fibre Channel disk drives inside the enclosure, and has an ESM-embedded Fibre Channel "loop switch." The loop switch is designed to essentially create point-to-point Fibre Channel communication, allowing the ESMs and drives to operate as though they were on a private Fibre Channel arbitrated loop, but with the performance and diagnostic advantages of Fibre Channel fabric. A great advantage of the DS4000 EXP810 is a significant reduction in the number of Fibre Channel nodes on the drive loops. Improved storage density with 16 disk drives supported inside the expansion unit provides more storage capacity than the 14 bay DS4000 EXP710. The DS4000 EXP810 supports 2 Gbps and 4 Gbps disk drive modules. Note: When configured with 2 Gbps drives, the 4 Gbps disk drive module will run at 2 Gbps speed.

Part of the DS4000 series

The DS4800 is part of the DS4000 series, which uses common storage management software and expansion enclosures. The DS4800 can be used with the DS4000 EXP710 and EXP810 Expansion Units utilizing Fibre Channel technology.

The DS4800 models can also be used with the DS4000 EXP100 Serial ATA disk drive storage unit. This helps address the requirements of various fixed content and data reference applications, which require large amounts of storage capacity but do not have the high utilization and access characteristics satisfied by DS4000 EXP710 and EXP810 Fibre Channel disk drive storage.

Scalability throughout the series

Because the DS4800 is highly scalable—up to 224 Fibre Channel or 224 Serial ATA disk drives—it can be upgraded from a workgroup SAN to an enterprise network storage system, thereby helping provide flexibility to grow with your business. In addition, by using the IBM TotalStorage DS4000 Storage Manager software, multiple DS4800s can be combined to help address additional performance and capacity requirements—further enhancing your scalability options.

Another scalability feature of the DS4800 is Dynamic Capacity Expansion (DCE), which is designed to provide the ability to add DS4000 EXP810, DS4000 EXP710 or DS4000 EXP100 enclosures to an existing DS4800 without stopping operations. By adding these enclosures, the DS4800 can help bring unused storage online for a new host group or an existing volume to provide additional capacity on demand.

It is designed to allow upgrades to higher performing DS4000 series systems while keeping data intact, helping to minimize disruptions during upgrades. The DS4800 also supports online controller firmware upgrades to help provide better performance and functionality. Events such as upgrades to support the latest version of DS4000 Storage Manager or to add services such as DS4000 Service Alert or the new DS4000 Alert Manager can often be executed without stopping operations.

DS4000 Intermix feature for attaching Fibre Channel and Serial ATA Disk Storage Expansion units

The IBM System Storage DS4800 mid-range disk system has the capability to support attachment of both DS4000 EXP810/EXP710 Fibre Channel Disk Expansion units and DS4000 EXP100 Serial ATA Disk Expansion units concurrently and also supports attachment of both DS4000 EXP810 and DS4000 EXP710 Fibre Channel Disk Expansion units concurrently. This feature is designed to allow you to create and manage distinct array groups that are built from either FC or SATA disks and allocate logical drives to the appropriate applications utilizing a single DS4000 system. Those applications that demand high performance and have high I/O rates could use the FC-based drives, while near-line or applications that do not demand the higher performance can be maintained on the SATA based-drives.

Centralized administration through DS4000 Storage Manager

The TotalStorage DS4000 Storage Manager software included with the DS4800 is designed to support centralized management of all local and networked DS4000 series systems. DS4000 Storage Manager allows administrators to quickly configure and monitor storage from a Java™ technology-based GUI. It is also designed to allow them to customize and change settings as well as configure new volumes, define mappings, handle routine maintenance and dynamically add new enclosures and capacity to existing volumes—without interrupting user access to data. Failover drivers, performance-tuning routines and cluster support are also standard features of the DS4000 Storage Manager.

By providing these features and an intuitive user interface, the DS4000 Storage Manager is designed to help reduce the complexity of storage management and the amount of time spent managing storage.

Enhanced storage management capabilities

The IBM System Storage DS4800 has several features designed to improve data management and storage system performance. Using the DS4000 Storage Manager software, administrators can partition the DS4800 into as many as 64 virtual servers. This capability allows IT organizations to strategically allocate storage capacity, helping to optimize the utilization of storage space and helping reduce hardware and storage management costs. Instead of purchasing multiple RAID controllers with their own dedicated disks and management, organizations can attach multiple servers to one central system—the DS4800—which is designed to provide hardware failover with dual controllers and common management.

Other DS4800 features that can help enhance data management and protection include FlashCopy, Dynamic Volume Expansion, VolumeCopy and Enhanced Remote Mirroring.

The FlashCopy feature is designed to take point-in-time copies of logical volumes, which may be used for file restoration, backups, application testing or data mining.

Dynamic Volume Expansion is designed to allow administrators to resize logical volumes without disrupting users. This feature can work well for applications with rapidly growing data requirements, such as IBM Lotus Notes® and Microsoft® Exchange.

VolumeCopy feature is designed to provide full replication of one logical volume (source) to another (target) within the DS4800. VolumeCopy is designed to allow read-only access to the source volume during the copy process, and suspend writes to support point-in-time integrity.

Enhanced Remote Mirror consists of Global Mirror with Asynchronous Write-order Consistency, which is critical for mirroring multi-LUN applications, Global Copy with Asynchronous and Metro Mirror with Synchronous.

Additional tools to help manage storage

The DS4800 is supported by a variety of IBM Tivoli® software products, including IBM Tivoli Storage Manager and IBM Tivoli Storage Resource Manager, as well as many other third-party hardware and software products. These applications can add to the capabilities of the DS4800 by enabling backup and storage reporting.

The IBM System Storage Proven™ program is designed to identify and test many of these products for interoperability with the DS4800 and other IBM disk products. Products in this program have been tested to help reduce or eliminate time-consuming installation and support issues. For more information, please visit **ibm.com**/storage/proven.

Service and support

The DS4800 has a three year, 9x5, next business day hardware warranty. Additional services for hardware installation, DS4000 Storage Manager configuration and advanced storage management are also available from IBM Global Services (IGS). IBM Support Line services can assist with using DS4000 Storage Manager, helping to enable customers to self-maintain their DS4000 system.

The optional DS4000 Service Alert and the new DS4000 Alert Manager services are designed to enable the DS4800 to quickly notify the IBM Support Center when the system detects a problem, helping to reduce or eliminate the need for the customer to place a service call. This feature is capable of forwarding error alert messages (via e-mail) from DS4000 Storage Manager to IBM to help expedite diagnosis and repair of failed hardware and software problems.

Competitive financing options from IBM Global Financing

IBM Global Financing offers some of the industry's most competitive rates for a wide range of IBM products and services, including the DS4800, for the duration of the financing term. IBM provides faster, simpler and more responsive IT financing with highly competitive rates, flexible terms, predictable costs and fast approval process for DS4800 and associated software and services. For more information, please visit **ibm.com**/financing.

IBM System Storage DS4800 at a glance

Characteristics	
Model	1815-80A, 1815-82A, 1815-84A , 1815-88A
RAID controller	Dual active
Cache	Model 80A: 4GB battery-backed Model 82A: 4GB battery-backed Model 84A: 8GB battery-backed Model 88A: 16GB battery-backed
Host interface	8 host ports—Fibre Channel (FC) Switched and FC Arbitrated Loop (FC-AL) standard, auto-sensing 1 Gbps/2 Gbps/4 Gbps
Drive interface	8 drive ports—Fibre Channel (FC) Switched and FC Arbitrated Loop (FC-AL) standard, auto-sensing 2 Gbps/4 Gbps
Supported drives	2 Gbps SATA: 7.2K rpm, 400GB and 250GB 4 Gbps SATA: 7.2K rpm 500GB 2 Gbps FC: 15K rpm, 146GB/73GB/36GB (E-DDM) 2 Gbps FC: 10K rpm, 300GB/146GB/73GB (E-DDM) 4 Gbps FC: 15K rpm, 146GB/73GB/36GB (E-DDM)
RAID levels	0, 1, 3, 5, 10
Storage partitions	8, 16 or 64 storage partitions—choice of 8, 16 or 64 required Upgrade: 8–16, 16–64
Maximum drives supported	Model 80A: 224 drives (using 14 DS4000 EXP810, 16 EXP710 or EXP100 Expansion Units) Model 82A: 224 drives (using 14 DS4000 EXP810, or 16 EXP710 or EXP100 Expansion Units) Model 84A: 224 drives (using 14 DS4000 EXP810, or 16 EXP710 or EXP100 Expansion Units) Model 88A: 224 drives (using 14 DS4000 EXP810, or 16 EXP710 or EXP100 Expansion Units)
Fans and power supplies	Dual redundant, hot-swappable
Rack support	19-inch, industry-standard rack
Management software	IBM TotalStorage DS4000 Storage Manager Versions 9.16
SAN support	Supported IBM FC switches and directors (product numbers 2005, 2006, 2109, 3534, 2031, 2032, 2034, 2042, 2061 and 2062, and BladeCenter)
Warranty	Three year parts and labor warranty, 9x5 next business day, upgradeable to 24x7 with four hour response
Physical characteristics	
Dimensions	H 174.50 mm (6.87 in) W 481.75 mm (18.97 in) D 634.92 mm (25.0 in)
Weight	36.38 kg (80.2 lb)
Supported systems[1]	For a list of currently supported servers, operating systems, host bus adapters, clustering applications and SAN switches and directors, refer to the DS4800 Interoperability Matrix available at **ibm.com**/storage/disk/ds4800. For availability dates, configuration options, and attachment capabilities, refer to: **ibm.com**/storage/disk/ds4800 The DS4800 is supported only in rack installations. With optional features, up to 14 DS4000 EXP810, or 16 EXP710/EXP100 Expansion Units can be attached to the DS4800 a maximum of 224 drives.

For more information

Contact your IBM representative, IBM Business Partner or visit:

ibm.com/storage/disk/ds4800

© Copyright IBM Corporation 2006

IBM Systems and Technology Group
9000 Rita Road
Tucson, AZ 85744
U.S.A.

Produced in the United States
July 2006
All Rights Reserved

IBM, the IBM logo, the e-business logo, DS4000, eServer, e-business on demand, FlashCopy, Lotus Notes, System Storage, System Storage Proven, Tivoli and TotalStorage are trademarks or registered trademarks of International Business Machines Corporation in the United States, other countries, or both.

Intel is a trademark of Intel Corporation in the United States, other countries, or both.

Microsoft is a registered trademark of Microsoft Corporation in the United States, other countries, or both.

Java is a trademark of Sun Microsystems, Inc. in the United States, other countries, or both.

UNIX is a registered trademark of The Open Group in the United States and other countries.

Linux is a registered trademark of Linus Torvalds in the United States, other countries, or both.

Other company, product and service names may be trademarks or service marks of others.

This document could include technical inaccuracies or typographical errors. IBM may make changes, improvements or alterations to the products, programs and services described in this document, including termination of such products, programs and services, at any time and without notice. Any statements regarding IBM's future direction and intent are subject to change or withdrawal without notice, and represent goals and objectives only. The information contained in this document is current as of the initial date of publication only and is subject to change without notice. IBM shall have no responsibility to update such information.

IBM is not responsible for the performance or interoperability of any non-IBM products discussed herein. Performance data for IBM and non-IBM products and services contained in this document was derived under specific operating and environmental conditions. The actual results obtained by any party implementing such products or services will depend on a large number of factors specific to such party's operating environment and may vary significantly. IBM makes no representation that these results can be expected or obtained in any implementation of any such products or services.

MB, GB and TB equal 1,000,000, 1,000,000,000 and 1,000,000,000,000 bytes, respectively, where referring to storage capacity. Actual storage capacity will vary based upon many factors and may be less than stated. Some numbers given for storage capacities give capacity in native mode followed by capacity using data compression technology.

THE INFORMATION IN THIS DOCUMENT IS PROVIDED "AS-IS" WITHOUT ANY WARRANTY, EITHER EXPRESSED OR IMPLIED. IBM EXPRESSLY DISCLAIMS ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR INFRINGEMENT. IBM products are warranted according to the terms and conditions of the agreements (e.g., IBM Customer Agreement, Statement of Limited Warranty, International Program License Agreement, etc.) under which they are provided.

References in this document to IBM products, programs or services do not imply that IBM intends to make such products, programs or services available in all countries in which IBM operates or does business. Any reference to an IBM program or product in this document is not intended to state or imply that only that program may be used. Any functionally equivalent program or product that does not infringe IBM's intellectual property rights may be used instead. It is the user's responsibility to evaluate and verify the operation of any non-IBM product, program or service.

IBM's customer is responsible for ensuring its own compliance with legal requirements. It is the customer's sole responsibility to obtain advice of competent legal counsel as to the identification and interpretation of any relevant laws and regulatory requirements that may affect the customer's business and any actions the customer may need to take to comply with such laws. IBM does not provide legal advice or represent or warrant that its services or products will ensure that the customer is in compliance with any law.

[1] For specific details and configuration availability, please visit **ibm.com**/storage/disk/ds4800.

TSD01054-USEN-08